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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/718,482	11/19/2003	Xiao Yang	021713-000400US	8443

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EXAMINER

NGUYEN, TUAN H

ART UNIT PAPER NUMBER

2813

DATE MAILED: 06/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/718,482

Applicant(s)

YANG ET AL.

Examiner

Tuan H. Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 March 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-45 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 38-45 is/are allowed.
- 6) ☒ Claim(s) 1-3, 6-17, 19-27, 31-35 and 37 is/are rejected.
- 7) ☒ Claim(s) 4, 5, 18, 28-30 and 36 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>11/03, 3/05</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 7-10, 12, 13, 16, 17, 20-23, 25, 32, 33-35, 37 are rejected under 35 U.S.C. 102(e) as being anticipated by Ma et al..

See Ma et al., figs. 2-6 and related text on pages 1-2, particularly fig. 6 and related text which discloses the claim electro-mechanical system including a first surface 12; an electrically activated electrode 14a coupled to the first surface 12, the electrically activated electrode 14a being coupled to an electrical source to receive a first electrical signal (paragraph [0017]); a moveable structure 16 suspended at a first height over the first surface, the moveable structure being attracted toward the electrically activated electrode 14a base upon the first signal, and interaction with one or more parasitic force; a landing post 22 having a plurality of side surfaces defined by height, a width, and a length and a lesser surface associated with a base, coupled to a lower side of the moveable structure 16, the landing post 22 being adapted to contact the base of the landing post against the first surface when the electrically activated electrode 14a receives a predetermined voltage bias associated with the first signal,

thereby maintaining an outer portion of the moveable structure 16 and the greater surface of the landing post 22 free from physical contact with the first surface and reducing a magnitude of one or more parasitic forces.

With respect to claims 7-10, 12, 32, 33, figs. 5-6 and paragraph [0025] show landing post 22, landing pad 24 and moveable structure 16 are part of signal line. Landing pad 24 is located at an outer edge of the electrically activated electrode 14a as shown in fig. 6.

With respect to claims 13, 16, 17, 20-23, fig. 6 shows top view of extension arm 18 electrically coupled to the moveable structure 16, and is bended when it makes contact with the first surface through landing pad 14b as shown in similar to embodiment of fig. 2C.

With respect to claims 25, 34, 35, 37 fig. 5 shows a mounting structure 26 coupled the first surface, a flexible member 18 coupled to the mounting structure 16 though the moveable 16, a landing post 22 coupled to a lower side of the moveable structure 16, the landing post 22 being adapted to contact a portion of the mounting structure 26 through the moveable structure 16. The moveable structure 16 being arrested in its motion toward the first surface by a portion of the flexible member 18 interacting with the mounting structure 26.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

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invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2, 3, 6, 11, 14, 15, 19, 24, 26, 27, 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ma et al. in view of Background of the invention.

Ma et al., figs. 1-4 and related text on pages 1-2 discloses substantially the claimed electro-mechanical system as explained above, except Ma et al. is silent about the landing pad, extension arm materials and the use of MEMS in micro-mirror array.

However, it would have been obvious to one of the ordinary skill in the art at the time the invention was made to have used silicon, polysilicon, copper, Ti, W, Al, or TiN for forming landing pad and extension arm, and used MEMS in micro-mirror arrays as suggested in the Background of the invention in Ma et al. process since those are well-known materials for use in forming conductive layer such as landing pad in semiconductor processing technology and the applications of MEMS in micro-mirror arrays, sensors, actuators, fiber-optics, optical switches, display devices or signal modulators as suggested in the Background of the invention are within the level of those skill in the art.

Allowable Subject Matter

Claims 38-45 are allowed.

Claims 4-5, 18, 28-30, 36 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: None of the references of record teaches or suggests the claimed electro-

mechanical system including the landing post bends when it makes contact with the first surface; or the extension arm comprises an extended portion adjacent to a recessed portion, the recessed portion effectively lengthening the at least one extension arm; or the flexible member is a torsion spring; or a third number of the plurality of the moveable structures are attracted toward the first number of the plurality of electrically activated electrodes base upon the first electrical signal, and a fourth number of the plurality of the moveable structures are repelled away from the second number of the plurality of electrically activated electrodes based upon the second electrical signal; or bending the landing post in response to the electric field of the second magnitude and generating a restoring force present in the landing post.

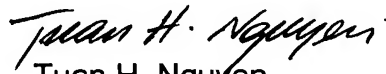
The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Miller et al., Kolowski, Fushinobu, Biebl, and Kubena et al. various methods for overcoming stiction in MEMS.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuan H. Nguyen whose telephone number is 571-272-1694. The examiner can normally be reached on 9AM-5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead Jr. can be reached on 571-272-1702. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Tuan H. Nguyen
Primary Examiner
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